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UNITED STATES DEPARTMENT OF AGRICULTURE  
Bureau of Agricultural Engineering

## MONTHLY NEWS LETTER

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Mr. McCrory is in Nebraska in connection with the proposed migratory waterfowl refuge of the Bureau of Biological Survey in Cherry County. He will later attend a meeting of the Farm Equipment Institute in Chicago.

Geo. R. Boyd held a conference with G. R. Shier and N.A. Kessler at Columbus, O., regarding the land-development cooperative work in that State.

The offices of the Bureau of Agricultural Engineering at Stoneville, Miss., have been moved from the original spaces in the Mississippi Delta Experiment Station building to the Government-owned fiber laboratory and office building.

The Cotton Ginning Investigations have been forced to operate two shifts during this month in an effort to conduct tests on damp cotton while the supply is available. All cotton is maturing very rapidly this year, and the season will be short.

F.E. Hardisty reports that 120 visitors attended a plowing and planting demonstration on terraced land held at the LaCrosse Station September 8. The demonstration was held for the benefit of farmers having new terraces built under the supervision of the Civil Conservation Corps engineers or by the Soil Erosion Service, and for the superintendents of the CCC camps.

Mr. Hardisty has completed the construction of a relief model of terraced and unterraced land which will be exhibited at the County Fair in LaCrosse, Wisc., during the second week in September. This model is fitted with atomizers operated by a pump for the production of artificial rainfall.

An experimental section of asphalt paving of a terrace outlet ditch has been completed by F.O. Bartel. Shortly after the paving was completed and before it had time to set, a rain of .85 inch August 24 washed out considerable sections of the paving. As a result of this work, it appears doubtful whether this type of paving can be utilized successfully on the soils and slopes typical of the Statesville Station.

As reported by A. T. Holman 6.02 inches of rain fell between August 14 and September 7, at Bethany, Mo., breaking the drought. The rains came too late to help the corn crop which was a total failure on the erosion station but stored sufficient moisture to make a good seed bed for wheat and grasses this fall.

C. E. Ramser left Guthrie the early part of September to inspect Soil Erosion Service projects in Texas, Louisiana, Mississippi, Alabama, Georgia, South Carolina, North Carolina, and Virginia. After completing this inspection Mr. Ramser will return to Washington, probably about October 1.

W. D. Ellison conferred with Bureau officials in the Washington office relative to Civilian Conservation Corps in Tennessee and other Southern States.



Sixty-seven days without rainfall at the Guthrie Station were followed by 14.50 inches of rainfall during the 20 day period, August 20th to September 10th. This precipitation occurred as seven major storms, all of which produced considerable run-off. The storm of greatest volume and intensity occurred on September 10th with a total volume of 4.20 inches and intensity varying from 5.18 inches per hour for five minutes to 2.25 inches per hour for 60 minutes. Due to the saturated condition of the soil this storm produced the highest rates of run-off yet recorded at the Guthrie Station.

Several conferences were held by R. L. Parshall and engineers of the Bureau of Reclamation at Denver relative to the problem of desilting works for the All-American Canal. Objection was raised to the design that it was too complicated and would require considerable attendance. It was believed, also, that the use of metal grating vanes was objectionable because of the alkalinity of the river water which would tend to corrode and eventually destroy these thin metal parts. To overcome the objection to the requirement of attendance, a new idea is being developed which will reduce to a minimum the amount of attendance required and also the amount of water necessary for sluicing. A model set-up of this new plan is being made at the Bellvue laboratory.

Considerable time was spent by Karl Harris in connection with F.E.R.A. activities in Arizona, he having been appointed as Advisor on their water development problems. In company with A. B. Ballantyne of the University of Arizona Agricultural Extension Service, two trips were made to Yuma, where the situation on the Yuma Mesa was studied. It was found that the flow of the Colorado River was the lowest that had ever been known and there is a probability that it may be still lower during September and October, in which case it is anticipated a great deal of injury may result to the citrus trees and crops. A recommendation was made by Messrs. Harris and Ballantyne that a loan of \$28,000 be granted these growers for putting down wells but that it be made available in progressive amounts, that is, that only one well be authorized at a time and as the flow of the river decrease, additional wells be drilled. The recommendation was approved in Washington. Mr. Harris was also appointed on a committee to investigate the application of the City of Flagstaff for a grant to develop water for domestic purposes. The same committee investigated the application for deep wells, of the Linden and Burton communities in southern Navajo County and made a survey of the drought conditions in the Duncan Valley in Greenlee County. Mr. Harris reports that drought conditions in the State were greatly relieved during August.

L. T. Jessup prepared a report for the Agricultural Adjustment Administration containing data for practically all of the drainage basins in the State of Washington relative to precipitation, stream discharge, area reclaimed by irrigation and drainage, power developed, storage available, and estimates of possible future development with respect to irrigation, drainage, storage and power.

Design and cost estimate of a pumping plant for a proposed supplementary water supply system for the Great Plains Field Station at Mandan, North Dakota, was prepared by Carl Rohwer. The problem generally consists of providing an auxiliary basin located in the grounds at the headquarters of the Experiment Station, from which water will be pumped through a pipeline 4,500 feet long to a buried tank situated on the top of a small knoll at an elevation of 200 feet above the receiving tank.



During the current season the Bureau of Agricultural Engineering with its experimental equipment at Jeanerette, La., has dried for the Bureau of Dairy Industry 12 tons of soybeans, 13 tons of cowpeas, and 18 tons of alfalfa according to E. D. Gordon. These various lots of forage are being fed to dairy animals as part of feeding tests to determine the nutritional value of dehydrated forage. The average cost of drying the cowpeas and soybeans is \$5.95 and \$6.75 per ton, respectively.

S. W. McBirney advises that draft and effectiveness-of-lifting tests are being made with different types of beet lifters operating under various field conditions. One observation is that beet lifting as generally practiced in California requires excessive power, and any subsequent benefits of the subsoiling are questionable. Furthermore, many beets are not sufficiently loosened to be satisfactorily elevated mechanically by the tops.

On September 13, E. M. Mervine in cooperation with the Sugar Office, Bureau of Plant Industry, conducted a field day. There were 93 visitors, consisting of officials from the Holly American Crystal and Great Western Sugar companies with their factory managers and field men and a sprinkling of county agents. A third of the program was devoted to sugar beet machinery developments.

Experimental studies during the past 1 1/2 years on sugar beet planters have led to the application for patents on a hill planter by E. M. Mervine and S. W. McBirney. The principles involved have now, to a certain extent, been incorporated in a commercially built planter, which gives evidence of being a desirable piece of equipment. This method of planting will save approximately \$1.75 an acre on cost of seed and should give increased yield because of regularity of spacing.

In field applications, E. M. Dieffenbach of Albany, Ga., has been comparing different methods of making spray applications. Schley and Stuart pecan trees have been sprayed with various pressures, apertures, and gun combinations. The data on these comparisons have not yet been worked up.

Thayer Cleaver reports that a series of plow draft tests were made at the Urbana, Ill. station during the week of September 10 to 15, with the Toledo, Ohio station and the Department of Agricultural Engineering, University of Illinois, cooperating. A. H. Graves of the Toledo station and Thayer Cleaver of the Urbana station who made the tests obtained some very satisfactory results. The tests were made principally for comparing the draft of plows equipped with the recently developed disc jointers and with standard coulters and jointers.

The plots for the farm tillage machinery laboratory at Auburn, Ala. were completed the latter part of August. These plots consist of 9 units each 250 by 20 by 2 feet, separated by concrete walls on which are mounted 40 pound 8 by 10 foot 'H' beam rails. The plots have waterproof bases and are to be provided with means of irrigation, and covers, thereby permitting control of the soil moisture. Eleven soils ranging in texture from light sand to a heavy clay in both the highly weathered and unweathered soils will be placed in these bins. Dr. George Scarseth of the Alabama Agricultural Experiment Station has assisted the Bureau in the selection of these soils. The actual soils selected have variations which are capable of scientific interpretation and are soils of major agricultural importance.

Plans and specifications have been completed for the following equipment for the farm tillage machinery laboratory: Utility car, power car, power car dynamometer, and the reaction dynamometer. Previous studies of tillage machinery have measured only one force component from the implement.



The reaction dynamometer equipped with 8 measuring cells will be capable of measuring the 3 normal linear forces and the 3 rotating forces acting upon an implement. This equipment will make it possible to obtain data which will be of basic value in future design of tillage implements.

R. M. Merrill of the Toledo office spent August 20 at Pennsylvania State College to observe a vapor method of spraying which is being tested by Dr. Nixon, plant pathologist. On this trip Mr. Merrill also attended the orchard field day at the Ohio Experiment Station at Wooster, where several demonstrations of methods of control of orchard pests were observed.

On the corn production machinery project at Ames, Iowa, C. K. Shedd reports that a study is being made this fall of labor and power requirements in harvesting corn stover. About 100 acres of corn will be cut and shocked. In doing this work, records will be secured of the use of the corn binder, the two-row sled harvester, and a single-row sled harvester. A study will also be made of possibilities for reducing labor expenditures in shredding and baling. The stover produced will cover a large part of the cost of the experimental work in harvesting.

A. D. Edgar returned to Presque Isle, Maine, after spending about 3 months in the Washington office.

On July 27 W. V. Hukill left for southern California for the purpose of conducting a test on lemons enroute from Colton, Calif. to New York. Twelve of the new electric anemometers were used in this test to determine the velocity of air movement in ventilated and iced refrigerator cars. In confirmation of the results of an earlier test it was found that the air velocity under the floor rack of a car in which ice was applied in the upper half of the bunkers only was considerably greater than that in a car with full bunkers of ice. The air velocity in a car in which ice was applied in the lower half of the bunkers only was much lower than in either of the other cars. The ice in the first mentioned car was supported by grates midway up in the bunkers of the car. It is thought that the faster air circulation in the car with the ice in the upper half only may be attributed to the fact that the lower half of the bunker had no ice in it and therefore offered much less resistance to air flow. It was further found that in the full-bunker car the air velocity was fairly uniform at points equally distant from the bunker. Most of the air was found to travel more than a quarter of the length of the car before going up through the load.